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New World Trees (Excluding Canada and the United States): A Selected Bibliography for Identification

Authors

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Cover

Four examples of new world trees. 1. *Dacryodes excelsa*, a canopy dominant, non-pioneer species. 2. *Cecropia schreberiana*, a fast growing, but short-lived pioneer species. 3. *Bursera simaruba*, a deciduous non-pioneer species. 4. *Cephalocereus royenii*, a non-pioneer arborescent cactus. The first two species are from the subtropical wet forest life zone, while the other two are from the sub tropical dry forest life zone. Photos by Ariel E. Lugo.

Preface

This bibliography of New World trees (excluding Canada and the United States of America) was initially planned to be published in the proceedings of the Golden Anniversary Symposium of the USDA Forest Service Institute of Tropical Forestry, now the International Institute of Tropical Forestry. Production schedules made it impossible to include the bibliography in Lugo and Lowe (1995) as was planned. However, the bibliography is sufficiently valuable to stand on its own as a special publication of the International Institute of Tropical Forestry. Accordingly, we have arranged for its publication knowing that scientists and the public in general will benefit from its use. This bibliography is the third publication to result from the celebration of the golden anniversary of the institute, the other two being Lugo and Lowe (1995), and Lugo and Mastroantonio (1999). Users are encouraged to correspond with the institute as we continue to do our best to organize and update the collective knowledge on tropical trees and tropical forests.

The following individuals made this production possible and we express our appreciation for their effort: Calvin Bey, Gisel Reyes, Evelyn Pagan, Jorge Morales, and Griselle González.

Ariel E. Lugo
Rio Piedras, October 1996

Literature Cited

Lugo, A.E.; Lowe, C., editors. 1995. Tropical forests: management and ecology. New York: Springer Verlag. 461 p.

Lugo, A.E.; Mastroantonio, L. 1999. Institute of Tropical Forestry – the first 50 years. General Technical Report IITF GTR-7. Rio Piedras, PR: U.S. Department of Agriculture, Forest Service, International Institute of Tropical Forestry. 56 p.

Introduction

This bibliography of more than 700 titles is intended as a useful reference for identification of New World trees and also indirectly indicates where future studies would be helpful. It was prepared for the Golden Anniversary Symposium of the Institute of Tropical Forestry, Forest Service, United States Department of Agriculture, at San Juan, Puerto Rico, on May 24-26, 1989. During the past half century, much progress has been made in identifying New World trees, notably by scientists working at the Institute.

Because of the large number of titles and the limited space in this volume, a separate expanded bibliography is planned as a Forest Service, United States Department of Agriculture, publication. To complete New World coverage, Canada, the continental United States, and Hawaii will be added, as well as a table of contents, an index to the authors, and an expanded introduction. While embracing the half century 1939-89, the scope of this bibliography extends back to earlier classic references that are still useful.

Accurate tree identification is essential for forest management and research and for utilization of and commerce in wood and other forest products. Therefore, local common names and lumber trade names in various languages must be correlated with their international scientific equivalents. The scientific (Latin) name is the key to all printed records. Now, in the computer age, information about trees is easily retrieved from libraries.

In an earlier review of the status of tree identification in Latin America, the first author planned this bibliography and estimated that perhaps as many as 90 to 95 percent of the tree species had been named (Little 1972 INT, citation of author with year and abbreviation refers to the year of publication and to the country or other heading as listed below in the contents section). This estimate has now been raised to more than 95 percent. The total number of New World native trees may reach 25,000 species, possibly 30,000.

Coverage

References on trees, defined broadly, have been included. For this bibliography, a tree is defined as a woody plant at least 5 m (16 ft) in height with one erect perennial stem or trunk at least 10 cm (4 in) in diameter at breast height (DBH), which is 1.4 m (4.5 ft) above the ground, and a crown of branches and leaves. Woody plants with an unbranched trunk and small crown, such as palms, bamboos, and tree ferns, are included. Some listed references also cover smaller woody plants, such as shrubs and vines. A shrub is a woody plant smaller than a tree, usually with several perennial stems branching from the base. A woody vine or liana has weak or climbing stems supported by other plants or objects.

In addition to books devoted exclusively to trees, others of wide scope are cited. Technical references, such as descriptive floras and manuals on seed plants (mostly herbs and shrubs), are useful, especially for the numerous minor species not found in guides to common trees. Some local floras and vegetation studies, such as those for national parks, are noted. Plant lists and catalogs are helpful in matching common and scientific names. Taxonomic monographs, technical references with descriptions, and keys for identification of species of a genus or family, have been added for some tree groups of commercial importance or that have many species, or a wide distribution. Monographs limited to one country are listed

under that country's name. Publications on woods generally are omitted, unless they include tree notes or lists. Articles on new species, range extensions, etc., are excluded. Some unpublished theses have been inserted with the suggestion that they be duplicated in whole or part.

As the title indicates, this bibliography covers the New World or the Western Hemisphere (except Canada and the continental United States), an area also known as Latin America. It includes tropical America from Mexico and West Indies southward and through Central America and South America to the southernmost parts of the South Temperate Zone (Uruguay, southern Argentina, and southern Chile). Oceanic islands, with relatively few tree species, and Antarctica, with none, are omitted. Meanwhile, the continental United States (with fewer than 500 additional native tree species) already has a bibliography (Little and Honkala 1976 INT) and a checklist (Little 1979 INT). Hawaii has a handbook on common forest trees (Little and Skolmen 1989 INT, references on p. 308-314) and a guide to common ornamental native trees and shrubs (Kepler 1991 INT). *Native Trees of Canada* (Hosie 1979 INT, p. 343-346) cites other tree books. Canada has fewer than 150 native tree species, all are found within the United States. Thus, this bibliography covers all but about 500 native species of the New World trees!

A publication about trees of one country is useful in parts of nearby countries because natural ranges of species do not correspond to artificial political boundaries. Thus, references for the 10 countries bordering Brazil will also serve adjacent nations. Furthermore, books covering small areas or countries are easier to use than those covering large areas because fewer species are involved. Books on ornamental, shade, fruit, and timber trees have wide geographical use because many tropical trees are distributed and cultivated around the world.

Preparation

The work of compiling this bibliography was centered at three libraries: the International Institute of Tropical Forestry; the Botany Library, United States National Museum of Natural History, Smithsonian Institution, and the National Agricultural Library.

The first author has done field work on tropical American trees in many countries, beginning during the World War II (1943-45) and totaling 7 years. He has consulted many of these references while identifying, teaching, and writing and has met many of the persons cited. The second author was in charge of the library and publications at the Institute of Tropical Forestry from 1972 to 1990.

Forestry Abstracts has been the most helpful bibliographic periodical. Limited to forestry and trees, it lists fewer titles than periodicals covering broad agricultural or biological fields, but covers special forestry titles such as theses. Volumes 10 through 51 for the years 1948 through May 1991 were checked. Also examined were the complete files of the *Caribbean Forester*, volumes 1 through 24 for the years 1939 through 1963, published by the Institute of Tropical Forestry.

A computer search for titles was done at the National Agricultural Library with three databases and special assistance by Daniel G. Starr. The source of the monthly *Forestry Abstracts*, CAB, is prepared by CAB International, Commonwealth Agricultural Bureaux, Oxford University, Oxford, England. The source of the

monthly *Bibliography of Agriculture* is AGRICOLA (AGRICultural OnLine Access), prepared by the National Agricultural Library. The *International Information System for Agricultural Science and Technology* (AGRIS) of the Food and Agriculture Organization (FAO) of the United Nations, Rome, Italy, was also used. However, these excellent, relatively new databases do not go back very far into the past half century.

The heads of government forestry departments in many countries provided lists of the common references used for tree identification in their areas. Many specialists kindly reviewed and expanded the lists for their countries.

Bibliographies

Several general bibliographies (see contents and BIB sections) for plants have been valuable references, especially for older titles. Some countries have bibliographies for botany and forestry listed here under the country's name.

Timbers of the New World by Record and Hess (1943 GEN) was the first single volume to treat the trees and large shrubs of the entire Western Hemisphere. This reference summarizes descriptions of trees and wood, distribution, economic importance, names, and references for more than a thousand genera or 85 percent of New World trees. Commercial trees are identified. Most omitted genera are from subtropical regions of Mexico and Brazil.

Blake and Atwood (1942 BIB) prepared a detailed annotated work, *A Geographic Guide to Floras of the World* (2 volumes, unfinished), with the New World in the first volume. The coverage is thorough for both general and local floristic works through 1939.

Frodin (1984 BIB) in his *Guide to the Standard Floras of the World* (completed to 1980) noted that the mass of floristic literature had increased many times since 1939. Some titles on trees were cited, but local floras were not. An updated revision is in preparation.

Floristic Inventory of Tropical Countries, edited by Campbell and Hammond (1989 BIB) is the newest bibliography. Many authors have reviewed the status of plant systematics for their own country, adding recommendations, notes on population and growth, and a current bibliography.

Theses

Some unpublished theses have been inserted as noted. They would be more useful locally if copied in whole or in part.

Plan

The arrangement of titles in this bibliography is alphabetical by authors under the main headings. These headings are abbreviated for citation and cross reference. Under each heading, several of the more detailed references for tree identification are designated by an asterisk (*). Although this bibliography is not annotated, scattered brief notes have been added in brackets.

Contents, with abbreviations for cross references, include subjects, countries, and other geographic groups. These are Introduction (INT); Bibliographies (BIB); Monographs; Gymnospermae (GYM); Monocotyledoneae (MON); Dicotyledoneae (DIC); General (GEN); Mexico (MEX); Central America (CAM): Belize (BEL), Costa

Rica (COS), El Salvador (ESA), Guatemala (GUA), Honduras (HON), Nicaragua (NIC), Panama (PAN); West Indies (WI): Bahamas (BAH), Bermuda (BER), Cuba (CUBA), Dutch West Indies (DWI), Hispaniola (HIS), Jamaica and the Cayman Islands (JAM), Lesser Antilles (LA), Puerto Rico (PR), Trinidad and Tobago (TT), Virgin Islands (VI); South America (SAM): Argentina (ARG), Bolivia (BOL), Brazil (BRA), Chile (CHI), Colombia (COL), Ecuador (ECU), French Guiana (FRG), Guyana (GUY), Paraguay (PAR), Peru (PERU), Suriname (SUR), Uruguay (URU), Venezuela (VEN).

Future Work

Puerto Rico, a relatively small, accessible, and intensively studied island, with the smaller adjacent Virgin Islands (United States and British), serves as a model for future studies. Publications concerning its flora include a fully illustrated reference (2 large volumes in both English and Spanish) describing 750 tree species (more than 435 of them native), a field guide to common trees and large shrubs, a volume on common vines (in Spanish), special keys to seedlings and leaves, local tree lists, a handbook on trees for urban use (with color plates, in both English and Spanish), a bibliography of forestry in Puerto Rico, and a newly published list of naturalized exotic tree species. Among general plant references are a new catalog of common and scientific names, a book on ferns, and a new descriptive flora of several volumes nearing completion.

Within the next half century, many new references for tree identification like those just noted for Puerto Rico will become available for many areas now lacking them. After completion of illustrated guides or handbooks for common trees, future needs include checklists of tree species, keys, books describing and illustrating less common trees, and publications on introduced and planted trees, and others on shrubs and woody vines. Special keys are being prepared for seedlings and other vegetative stages, fruits, bark, etc. Keys using hand-sorted, punched cards and computers merit further attention. Within 50 years when more references limited to trees become available, a similar bibliography for tree identification will omit general titles about plants, such as floras, vegetation studies, and works on common and medicinal plants.

Additional field work collecting tree specimens is needed in regions that are botanically poorly known or unexplored. Special efforts should be made to collect and name the remaining unknown New World tree species, estimated as less than 5 percent of the total but up to 1,500 species. If not found soon, some trees may become extinct. Botanical collectors should accompany new highway projects and surveys through natural forests and be present when large forest areas are logged. Of course, small representative areas of natural vegetation should be saved as national parks and similar reserves and refuges, to be used for research, education, recreation, and protection from extinction of plant and animal life with their ecosystems. Additional screening tests for useful products are of high priority.

Authors and publishers are urged to send copies or notices of new tree publications to large international forestry libraries, particularly those associated with databases and periodicals that publish abstracts, to ensure prompt listing. Notices, reprints, and books for deposit may be sent to: Library, Institute of Tropical

Forestry, USDA Forest Service, Call Box 25000, Río Piedras, PR 00928-5000. These publications will then be on hand for revisions of this bibliography. Information about important omissions as well as future titles will be welcomed for the expanded revision.

Introduction (INT)

Hosie, R. C. 1979. Native trees of Canada. Eighth edition. Fitzhenry & Whiteside Ltd., Don Mills, Ontario, Canada. In cooperation with the Canadian Forestry Service (Environment Canada) & the Canadian Government Publishing Centre, Supply & Services, Canada. [Bibliography, p. 343-346.]

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Little, E. L., Jr. 1979. Checklist of United States trees (native and naturalized). Agricultural Handbook. 541. United States Department of Agriculture, Washington, D.C., USA. [Lists for continental United States 679 native and 69 naturalized tree species. Numerous references include monographs.]

Little, E. L., Jr., and B. H. Honkala. 1976. Trees and shrubs of the United States: a bibliography for identification. Miscellaneous Publication 1336. United States Department of Agriculture, Washington, D.C., USA. [Includes Puerto Rico, Virgin Islands, and Hawaii.]

Little, E. L., Jr., and R. G. Skolmen. 1989. Common forest trees of Hawaii (native and introduced). Agricultural Handbook 679. United States Department of Agriculture, Washington, D.C., USA. [Selected references, p. 308-314.]

Bibliographies (BIB)

Bibliographies covering only one country are listed under that country's name.

Ahern, G. P., and H. K. Newton. 1928. Bibliography on woods of the world, exclusive of the temperate region of North America and with emphasis on tropical woods. American Society of Mechanical Engineers, New York, New York, USA.

Blake, S. F., and A. C. Atwood. 1942. Geographical guide to floras of the world: an annotated list with special reference to useful plants and common plant names. Part 1. Africa, Australia, North America, South America, and the islands of the Atlantic, Pacific, and Indian Oceans. Miscellaneous Publication 401. United States Department of Agriculture, Washington, D.C., USA.

Campbell, D. G., and D. Hammond, editors. 1989. Floristic inventory of tropical countries: the status of plant systematics, collections, and vegetation, plus recommendations for the future. New York Botanical Garden, New York, New York, USA. [A few countries are omitted, including Jamaica, tropical parts of southern Mexico, Paraguay, northern Argentina, and northern Chile.]

Flick, F. J., comp. [abbreviation unknown] 1953. The forests of continental Latin America (including European possessions): a bibliography of selected literature, 1920-1950. Bibliographical Bulletin 18. United States Department of Agriculture, Washington, D.C., USA.

Frodin, D. G. 1984. Guide to standard floras of the world: an annotated, geographically arranged systematic bibliography of the principal floras, enumerations, checklists, and chronological atlases of different areas. Cambridge University Press, Cambridge, UK.

Grijpma, P., and B. T. Styles. 1973. Bibliografía selecta sobre Meliáceas. No. 14. Instituto Interamericano de Ciencias Agrícolas, Turrialba, Costa Rica.

Stafleu, F. A., and R. S. Cowan. 1976-88. Taxonomic literature: a selective guide to botanical publications and collections with dates, commentaries and types. Second edition. 7 volumes. Bohn, Scheltema & Holkema, Utrecht, the Netherlands.

Villegas, C. comp. 1973. Bibliografía forestal de América tropical. No. 13. Instituto Interamericano de Ciencias Agrícolas, Turrialba, Costa Rica. [One of a series.]

Whitmore, J. L., and G. S. Hartshorn. 1969. Literature review of common tropical trees. Tropical Forestry Service Contribution 8. University of Washington, College of Forest Resources, Seattle, Washington, D.C., USA.

Monographs

Because of limited space, the titles included here cover large genera and families of economic importance. Those for only one country are listed under that country's name. Headings are Gymnospermae, Monocotyledoneae, and Dicotyledoneae.

Gymnospermae (GYM)

Buchholz, J. T., and N. A. Gray. 1948. A taxonomic revision of Podocarpus. I. Journal of the Arnold Arboretum 29:44-76, 117-151. [First of a series.]

Dallimore, W., and A. B. Jackson. 1967. A handbook of Coniferae and Ginkgoaceae. Fourth edition, revised by S. G. Harrison. St. Martin's Press, New York, New York, USA. [Reprint of 1966 ed.]

Liu, T. S. 1971. A monograph of the genus *Abies*. National Taiwan University, Taipei, Taiwan.

Mirov, N. T. 1967. The genus *Pinus*. Ronald Press Co., New York, New York, USA.

Monocotyledoneae (MON)

Balick, M. J., and H. T. Beck. 1990. Useful palms of the world: a synoptic bibliography. Columbia Press, New York, New York, USA.

Glassman, S. F. 1972. A revision of B. E. Dahlgren's index of American palms. Phanerogamarum Monographiae Tomus 6. J. Cramer, [city unknown], Germany. [76 genera, 167 species. Geographical list by countries.]

McClure, F. A. 1966. The bamboos: a fresh perspective. Harvard University Press, Cambridge, Massachusetts, USA.

McCurrach, J. C. 1960. Palms of the world. Illustrated with over 400 photographs. Harper & Brothers, New York, New York, USA.

Uhl, N. W., and J. Dransfield. 1987. Genera *Palmarum*: a classification of palms based on the work of Harold E. Moore, Jr. Allen Press, Lawrence, Kansas, USA.

Dicotyledoneae (DIC)

Backeberg, C. 1958-62. Die Cactaceae. Handbuch der Kakteenkunde. Fischer Verlag, Jena, Germany. 6 volumes.

Badillo, V. M. 1971. Monografía de la familia Caricaceae. [publisher unknown], Maracay, Venezuela. 221 columns.

Baehni, C. 1937. Les *Celtis* sud-americans. Candollea 17:189-214.

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Burkart, A. 1976. A monograph of the genus *Prosopis* (Leguminosae, sub-family Mimosoideae). Journal of the Arnold Arboretum 57:217-249, 450-525.

Cowan, R. S. 1968. Flora Neotropica Monogr. No. 1: *Swartzia* (Leguminosae, Caesalpinioideae, Swartzieae). Organization for Flora Neotropica and the New York Botanical Garden, [city unknown], New York, USA. [First of Flora Neotropica, a series of taxonomic monographs published by the Organization for Flora Neotropica and the New York Botanical Garden.]

Cuatrecasas, J. 1964. Cacao and its allies: a taxonomic revision of the genus *Theobroma*. Contribution of United States National Herbarium 35:379-614.

Dewolf, G. P., Jr. 1984. Revision of the indigenous genus *Ficus* in extratropical South America: Paraguay, Uruguay, Argentina, and southern Brazil (Rio Grande do Sul, Santa Catarina, Parana). Elliottia No. 2. Georgia Southern College, Statesboro, Georgia, USA.

Ewan, J. 1962. Synopsis of the South American species of *Vismia* (Guttiferae). Contribution of United States National Herbarium 35:94-337.

Gunn, C. R. 1984. Fruits and seeds of genera in the subfamily Mimosoideae (Fabaceae). Technical Bulletin 1681. United States Department of Agriculture, Washington, D.C., USA. [All 64 genera worldwide.]

Gunn, C. R. 1991. Fruits and seeds of genera in the subfamily Caesalpinioideae (Fabaceae). Technical Bulletin 1755. United States Department of Agriculture, Washington, D.C. USA. [148 genera worldwide.]

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Woodson, R. E., Jr. 1951. Studies in the Apocynaceae. 8: an interim revision of the genus Aspidosperma Mart. et Zucc. Annal of the Missouri Botanical Garden 38:119-206.

General (GEN)

Gentry, A. H. 1991. Four neotropical rainforests. Yale University Press, New Haven, Connecticut, USA. [La Selva, Costa Rica; Barro Colorado Island, Panama; Manaus, Brazil; Panu Park, Peru.]

Hanlon, R., F. Bayer, and G. Voss. 1975. Guide to the mangroves, buttonwood and poisonous shoreline trees of Florida, the Gulf of Mexico, and the Caribbean region. Sea Grant Field Guide Series No. 3. Miami University, [city unknown], Florida, USA.

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Howard, A. L. 1934. A manual of the timbers of the world: their characteristics and uses. Macmillan & Co., London, UK.

Hume, E. P. 1951. Some ornamental shrubs for the Tropics. P.R. Circular Federal Experiment Station, Puerto Rico. 34. United States Department of Agriculture, Federal Experimental Station. Puerto Rico.

Jiménez Saa, H. 1967. La identificación de los árboles tropicales por medio de características del tronco y la corteza. Tesis, IICA [university name unknown], Turrialba, Costa Rica.

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Mexico (MEX)

Along the northern border, references from the Southwestern United States are useful. Also helpful are publications on vegetation with species lists.

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